IN THE CLAIMS

CLAIMS

(CURRENTLY AMENDED)72. A process for treating wood having wood cellulose having a plurality of hydroxyl groups comprising the steps of:

providing a solution consisting essentially of a water compatible organic solvent and a dissolved solute having a functional group comprising an atom selected from the group consisting of trivalent, tetravalent and pentavalent atoms, wherein said atom is bonded to a halogen atom or a functional group selected from the group consisting of a hydroxyl group, alkoxy group, phenoxy group, benzyloxy group and an aryloxy group having a polycyclic aromatic ring,

and wherein the organic solvent is further defined as capable of allowing the dissolved solutes to be drawn from the solute into the wood;

adding a catalyst reacting with water in the wood to produce an acid;

applying said solution to the wood;

drawing the catalyst and solute into the wood;

reacting the catalyst with [the water in] the wood to produce a solvated acid;

covalently reacting said functional groups using the solvated acid with the cellulose.

(ORIGINAL) 73. The process according to claim 76 wherein the solutes are monomers and further comprising the steps of simultaneous reaction and diffusion of the monomers in the wood.

(CURRENTLY AMENDED) 74. The invention of claim 72 wherein heat is generated by the solutes reacting with the cellulose.

(ORIGINAL) 75. The process according to claim 72 wherein the process of drawing further comprises water in the wood pulling the solutes into the wood while simultaneously reacting the

water with the acid and reacting the cellulose with the solute.

(ORIGINAL) 76. The process of claim 72 wherein the solute is comprised of monomers prior to application of the solute to said wood.

(ORIGINAL) 77. The process of claim 72 wherein the catalyst is less than 10% by mass of the entire solution.

(ORIGINAL) 78. The process of claim 72 wherein the step of covalently reacting further comprises the step of catalytically bonding the functional group tetravalent atom across an oxygen of the cellulose.

79. CANCELLED.

(ORIGINAL) 80. A process for treating wood having wood cellulose having a plurality of hydroxyl groups comprising the steps of:

providing a solution consisting essentially of a water compatible organic solvent and a solute having a functional group comprising an atom selected from the group consisting of trivalent, tetravalent and pentavalent atoms, wherein said atom is bonded to a halogen atom or a functional group selected from the group consisting of a hydroxyl group, alkoxy group, phenoxy group, benzyloxy group and an aryloxy group having a polycyclic aromatic ring, and wherein the solvent is further defined as allowing the solutes to be drawn from the solute into the wood;

adding a catalyst reacting with water in the wood to produce a base;

applying said solution to the wood;

drawing the catalyst and solute into the wood;

reacting the catalyst with the water in the wood to produce a hydrolyzed base;

covalently reacting said functional groups with the hydrolyzed base and the cellulose.

(ORIGINAL) 81. The process of claim 72 wherein the acid is a strong acid.

(ORIGINAL) 82. The process according to claim 80 wherein the solutes are monomers and further comprising the steps of simultaneous reaction and diffusion of the monomers in the wood.

(ORIGINAL) 83. The process of claim 77 wherein the catalyst is in the range of 0.1-10% of the solution.

(ORIGINAL) 84. The process of claim 83 wherein the catalyst is in the range from 0.1 to 4.9% of the solution.

(ORIGINAL) 85. The process of claim 81 wherein the acid is selected from the group consisting of acids from alkyl-halide monomers with trivalent, tetravalent and pentavalent atoms.

(ORIGINAL) 86. The process of claim 85 wherein the acid is comprised of silicon and a halogen.

(ORIGINAL) 87. The process of claim 72 wherein the solute further comprises a non-catalyst producing molecule which reacts to covalently bond with wood cellulose in the presences of acid from the catalyst.

(CURRENTLY AMENDED) 88. The process of claim 87 wherein a molecule which does not produce an acid in the presence of water in wood cellulose reacts <u>to produce heat with wood cellulose</u> in the presence of the molecule producing an acid in the presence of water in wood cellulose.

(ORIGINAL) 89. The process of claim 88 wherein the non-acid producing molecule is from the group consisting of alkyl and hydroxyl or alkoxy bonded trivalent, pentavalent and tetravalent atoms and combines thereof.

(ORIGINAL) 90. The process of claim 85 wherein the catalyst is from the group consisting of hydrochloric, meta-phosphoric acid, poly-phosphoric acid, Phosphoric acid, and combinations thereof.

(ORIGINAL) 91. The process of claim 85 wherein the acid is in the range of 0.01-10% *in situ*.

(CURRENTLY AMENDED) 92. The process of claim 72 wherein the process further comprises avoiding water based formation of oligomers of the functional groups prior to applying said solution to said wood.

(ORIGINAL) 93. The process of claim 72 further comprising the step of:

adding at least one non-reactive additive to the wood cellulose that enhances a desired property selected from the group consisting of:

fire resistance,

insect resistance,

moisture resistance

color,

adhesion, and

insulation, and

combinations thereof.

(ORIGINAL) 94. The process of claim 93 wherein the step of adding at least one non reactive additive further comprises adding the additive to the solution.

(ORIGINAL) 95. The process of claim 93 wherein the step of adding the at least one non-reactive additive occurs before reacting the functional groups to bond with the wood cellulose.

(ORIGINAL) 96. The process of claim 93 wherein the additive is selected from the group consisting of:

diatimatious earth,

sodium silicates,

boron or silicon salts,

boric acid,

trimethy (trialkyl) borate,

Boron Halides (BF3, BCl3, etc.),

Boric Anhydride (boron oxide),

phosphorous compounds,

copper compounds,

metal alkoxide,

meta-phosphoric acid;

a hydrophobic reagents,

phosphoric acid, and

metaphoshoric acid,

and combinations thereof.

(ORIGINAL) 97.The process of claim 72 wherein the solute compound comprises functional groups selected from the group consisting of $R\text{-}X_a\text{-}Xb_3$, $R_3\text{-}X_a\text{-}X_b$, R_2,X_a,Xb_2, $R_4\text{-}X_a$, and X_aR_3 and wherein R is an alkyl or a combination thereof, is a trivalent, tetravalent or pentabalent atom or a combination thereof and X_b is a halogen or alkoxy or hydroxyl group or combinations thereof.

(ORIGINAL) 98. The process according to claim 72, wherein the wood cellulose has an original weight and wherein the duration of treatment attains a weight of a compound which is covalently bonded to the wood cellulose in a range of 0.1 to 10 weight percent of the original weight of the wood cellulose.

(ORIGINAL) 99. The process according to claim 72, further comprising forming cyclic interlocking molecules having as a part of the cyclic structure containing at least two carbons within the cellulose and at least two of the atoms from the functional groups consisting of trivalent,

tetravalent and pentavalent atoms.

(ORIGINAL) 100. The process of claim 81 further comprising the step of exposing the acids introduced into the wood to an acid neutralizing agent subsequent to the treatment.

(ORIGINAL) 101. The process of claim 81 further comprising the step of introducing an acid neutralizing agent into the wood prior to the exposure of the wood cellulose to the acid.

(ORIGINAL) 102. CANCELLED

(ORIGINAL) 103. CANCELLED

(ORIGINAL) 104. A process according to claim 72 wherein the wood cellulose is not dry and wherein the step of drawing further comprises solvating the functional groups by the water in the wood prior to being covalently bonded to the hydroxyl groups of said wood cellulose.

(ORIGINAL) 105. The process according to claim 72 further comprising the step of adding water to the wood cellulose prior to applying the solution to the wood cellulose.

(ORIGINAL) 106. A process for treating wood cellulose containing water, said cellulose having a plurality of hydroxyl groups comprising the steps of:

providing a solution comprised of a water compatible organic solvent and a solute having a plurality of unreacted solutes comprising an atom selected from the group consisting of trivalent, tetravalent and pentavalent atoms, wherein said atom is bonded to a halogen atom or a functional group selected from the group consisting of a hydroxyl group, alkoxy group, phenoxy group, benzyloxy group and an aryloxy group having a polycyclic aromatic ring, applying said solution to the wood cellulose; and simultaneously pulling said solution into the wood using the water within the wood and reacting said solute to form covalent bonds, and forming a matrix structure comprising reacted monomers and wood cellulose.

1 (ORIGINAL) 07. The process of claim 106 further comprising the step of:

adding at least one non-reactive additive that enhances a desired property selected from the group consisting of:

fire resistance,

insect resistance,

moisture resistance

color,

adhesion, and

insulation, and

combinations thereof.

(ORIGINAL) 108. The process of claim 107 wherein the step of adding the at least one non-reactive additive occurs before covalently bonding the compound to the wood cellulose.

109. CANCELLED.

(ORIGINAL) 110. The process according to claim 106, further comprising a step of exposing the wood to ultra-sound sonification while applying said solution.

(CURRENTLY AMENDED) 111. A process for treating wood cellulose, in wood having water in the wood having a plurality of hydroxyl groups comprising the steps of:

providing a solution comprised of a water compatible organic solvent; an acid; an atom selected from the group consisting of trivalent, tetravalent and pentavalent atoms, wherein said atom is bonded to a halogen atom or a functional group selected from the group consisting of a hydroxyl group, alkoxy group, phenoxy group, benzyloxy group and an aryloxy group having a polycyclic aromatic ring, applying said solution to the wood cellulose; solvating the acid with the water in the wood to produce a solvated acid and reacting the atom with the hydrolyzed acid and the wood cellulose to produce heat and a silicone cellulose bond.

(ORIGINAL) 112. The process of claim 111 wherein the step of reacting further comprises the step of pulling the atoms from the solvent into the wood.

(ORIGINAL) 113. The process of claim 111 wherein the acid is in the range of 0.1 - 10% of the solution.

(ORIGINAL) 114. The process of claim 112 wherein the molecule which produces an acid in the presence of

wood cellulose is in the range from 0.1 to 4.9% of the solution.

(ORIGINAL) 115. The process of claim 112 wherein the acid is selected from the group consisting of acids

from alkyl-silicon halides, acids from alkyl-halide monomers with trivalent, tetravalent and pentavalent atoms, hydrochloric, meta-phosphoric acid, poly-phosphoric acid, and Phosphori c acid and combinations thereof, wherein the acid is in the range of 0.01-10% *in situ.*

(ORIGINAL) 116. The process of claim 112 wherein a molecule which produces an acid in the presence of

water in wood cellulose is a molecule comprised of silicone and a halogen.

(ORIGINAL) 117.The process of claim 112 wherein a molecule which does not produce an acid in the presence

of water in wood cellulose reacts exothermically and spontaneously with wood in the presence of a molecule which does not produce an acid in the presence of water in the wood cellulose.

(ORIGINAL) 118.The process of claim 112 wherein the molecule which does not produce an acid in the

presence of water in the wood cellulose would include hydroxyl and alkoxyl bonded tetravalent atoms.

(ORIGINAL) 119. The process of claim 81 wherein the acid is produced by a molecule producing an acid in the presence of water in wood.

(ORIGINAL) 120. The process of claim 119 wherein the acid is in the range of 0.1-10% of the solution.

(ORIGINAL) 121. The process of claim 119 wherein the acid is in the range from 0.1 to 4.9% of the solution.

(CURRENTLY AMENDED) 122. The process of claim 119 wherein the molecule is a molecule comprised of a metal and a halogen.

(ORIGINAL) 123. The process of claim 120 wherein the functional group comprises a molecule being drawn from the into the wood from the organic solvent and therein producing an acid in the presence of water in wood cellulose and wherein the acid and solute reacts producing heat on application to wood at standard atmospheric temperature and pressure.

(CURRENTLY AMENDED) 124. A process for treating wood cellulose having a plurality of hydroxyl groups comprising the steps of: providing a solution comprised of a non-water-based hydrophilic organic solvent; a molecule which is drawn from the solution into the wood and produces an acid in the presence of water in the wood cellulose diffused as a chemical from the solution and bonding with wood in conjunction with water in the wood and generating in the bonding a catalyst; said solution further comprising a molecule drawn from the wood into the wood cellulose and not producing an acid in the presence of water in wood cellulose diffused as a chemical from the solution and bonding with wood cellulose in the presence of the catalyst generated by the molecule producing an acid in the presence of water in wood cellulose.

(ORIGINAL) 125. The process of claim 124 wherein the catalyst is an acid produced by the

molecule which produces an acid in the presence of water in the wood cellulose is defined as a molecule producing an acid causing a spontaneous reaction of the molecule producing an acid in the presence of water in wood cellulose.

(ORIGINAL) 126. The process of claim 125 wherein the acid or a molecule which produces an acid in the presence of wood cellulose is in the range of 0.1-10% of the solution.

(ORIGINAL)127. The process of claim 125 wherein the acid or a molecule which produces an acid in the presence of wood cellulose is in the range from 0.1-4.9% of the solution.

(ORIGINAL) 128. The process of claim 112 wherein the acid is selected from the group consisting of acids

from alkyl-silicon halides, acids from alkyl-hilade monomers with trivalent, tetravalent and pentavalent atoms, hydrochloric, meta-phosphoric acid, poly-phosphoric acid, and Phosphoric acid and combinations thereof, wherein the acid is in the range of 0.01-10% *in situ.*

(ORIGINAL) 129. The process of claim 128 wherein a molecule which produces an acid in the presence of

water in wood cellulose is a molecule comprised of silicone and a halogen.

(ORIGINAL) 130. The process of claim 129 wherein a molecule which does not produce an acid in the presence

of water in wood cellulose reacts exothermically and spontaneously with wood in the presence of a molecule which does produce an acid in the presence of water in the wood cellulose.

(ORIGINAL) 131. The process of claim 130 wherein the molecule which does not produce acid in the presence of water in the wood cellulose would include hydroxyl and alkoxyl bonded tetravalent atoms.

OBJECTIONS TO THE SPECIFICATION:

6. The examiner alleges in paragraph 6 that the word "sodium silicate" is not supported in the specification. On page 12 lines 17-19, the following language appears:

> (f) Due to the molecular reaction of "WPTC" and the wood's natural liquids, the wood expels liquid while absorbing sodium silicate and borax. The treated wood weighs approximately as much after treatment as before;"

On page 13 lines 13-14, the following language appears:

"WPTC may introduce Borax and Sodium Silicate into the wood molecules thereby providing significant water, fire, rot and insect protection."

On page 27 lines 20-22 and page 28 lines 1-2, the following language appears:

"Diatimatious earth, sodium silicates, or other boron or silicon salts may be used as a source of donor atoms. These may be mixed to provide intermediaries in solution which would, working together, carry out the desired end product in the wood. Examples of products having these qualities include boric acid, trimethy (trialkyl) borate, Boron Halides (BF3, BCl3, etc.), and Boric Anhydride (boron oxide)."

On page 29 lines 8-12, the following language appears:

"It is believed, but uncertain that borax and sodium silicate can be trapped inside a polymer shield formed by the reaction.

The current "WPTC" formula incorporating the carbon-silicon-halogen reagent, a boron donor, borax, sodium silicate, metal or metalloid catalysts or enhancers with THF or it's equivalents as the solvent."

9. The examiner alleges in paragraph 9 that there is not "a description of the solute being monomeric before application to the wood" is not supported in the specification. On page 30

lines 1-7 of the '165 patent, it reads as follows:

" While no chemical process necessarily results in a single outcome. Figure 6-b shows an approximation of the most likely end structure for cellulose without a complete replacement of hydroxyl atoms in the chain when trated with a mixture of silicon and boron under the process steps taught hereunder.

Figure 6a shows a less likely structural outcome which is improbable and is given more for purposes of disclosing all manner of potentially allowable structures as opposed to the structure considered a likely end product."

11. The examiner alleges in paragraph 11 that the original specification "does not disclose that the functional groups are solvated by water" is not supported in the specification. On page 37, lines 1-7 of patent '165, it reads:

"A plurality of Applicant's reactive molecules may enter to the wood cellulose from a solution as shown in Figure 17A. Here the solution is an alcohol 72 solvated solution, although there may be trace amounts of water 71 and other organic solvents 70. A pro-catalyst 27 (MeSiCl3 here) and a silicone donor 73 (MeSi(OCH3)3 here) are used to prevent the pro-catalyst 27 from adding too much acidity to the wood. The use of hydrophillic organic solvents and monomers allows the reaction to begin and proceed by simple diffusion of the solvents and reactants into the wood."

12. The examiner alleges in paragraph 12 that the specification as originally filed does not disclose "cyclic interlocking molecules having as a part of the cyclic structure at least two carbons within the cellulose and at least two of the atoms from the functional groups consisting of trivalent, tetravalent, and pentavalent atoms". Figure 11 shows the described compounds.

14. The examiner alleges in paragraph 14 that new matter was added to the claims in the 11/18/2003 amendment but that was not in the application as originally filed. This has been corrected in the claims.